

REMARKS

In view of the above amendments and following remarks, reconsideration of the objections and rejections contained in the Office Action of March 31, 2004 is respectfully requested.

A substitute abstract has been provided to direct the abstract more toward the claimed invention in accordance with the requirement made in section 1 on page 2 of the Office Action. It is further noted that the specification has been amended in accordance with section 2 on page 2 of the Office Action. Further, a number of minor typographical corrections have been made to the application as a whole by the above amendments. In addition, Fig. 4 has been amended to correct reference number 53.

In the Office Action, the Examiner rejected claim 3 as being anticipated by either Takahashi et al. or Shultz et al. Further, claims 1-10 were rejected as being anticipated by Lenkersdorfer. Further, claims 11-13 were rejected as being anticipated by Muilenburg et al. Claims 14-16, further, were rejected as being anticipated by Sandhu et al. However, it is respectfully submitted that the present invention, particularly as now claimed, clearly patentably distinguishes over each of these references.

By the above amendments, claims 1-16 have been canceled. Accordingly, the rejections raised by the Examiner have been rendered moot. This should not be taken as any acquiescence to the factual statements or legal positions and conclusions taken by the Examiner in the Office Action, however. New claims 17-35 have replaced original claims 1-16. Claims 17, 24, 29 and 32 are the independent claims. Each of these independent claims is directed toward an apparatus for polishing a substrate on which a circuit wiring pattern is formed. Each of these independent claims includes the recitation of an attitude control mechanism as well as an image processing apparatus.

More specifically, independent claims 17 and 24 recite an attitude control mechanism for keeping the lower surface of the substrate carrier parallel with the polishing surface. Independent claims 29 and 32 recite an attitude control mechanism for preventing the substrate carrier from being inclined. All of the claims recite an image processing apparatus for recognizing a circuit wiring pattern formed in the substrate. Independent claims 24 and 32 further more specifically recite "an

image processing apparatus for recognizing a circuit wiring pattern formed on the substrate positioned at an outer peripheral portion of the polishing table."

The attitude control mechanism is generally supported by the text in the specification as set forth in paragraph 42, paragraphs 51-56 and paragraphs 73-81. Also note Figs. 4-8 and 14-17. The image processing apparatus is supported at by the discussion in paragraph 88.

As discussed in paragraph 42, the attitude of the substrate carrier is controlled by the attitude controller so that the lower surface holding the substrate W is kept parallel with a polishing surface, whereby contact pressure between the surface of the substrate W and the polishing surface can be made uniform across the entire area of the surface of the substrate. Polishing can thus be made uniform across the entire area of the substrate. Furthermore, the distance between the image processing apparatus and the surface of the substrate can be kept constant during the polishing operation. There is thus no possibility that the image processing apparatus will become out of focus. A precise recognition operation of the circuit wiring pattern can thus be performed during the polishing operation.

If the attitude control mechanism were not provided, there would be a risk that the image processing apparatus would be out of focus, because the distance between the image processing apparatus and the substrate would be variable due to tilting of the substrate carrier holding the substrate during the polishing operation. Thus, the present invention avoids this risk.

None of the references cited by the Examiner discloses or suggests an attitude control mechanism for keeping the lower surface of the substrate carrier parallel with the polishing surface, or preventing the substrate carrier from being inclined. Neither do any of the references cited by the Examiner disclose or suggest an image processing apparatus for recognizing a circuit wiring pattern on the substrate in combination with the attitude control mechanism. Thus, it is respectfully submitted that each of the independent claims, now reciting these features, clearly distinguishes over each of the references cited by the Examiner.

The various dependent claims further distinguish over the prior art cited by the Examiner. However, further discussion of the dependent claims does not seem necessary at this point in time in view of the clearly distinctions between the independent claims and the cited references.

The Examiner's attention is further drawn to the accompanying Information Disclosure Statement citing a number of additional prior art patents to the Examiner's attention.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

Norio KIMURA et al.

By: 

Nils E. Pedersen
Registration No. 33,145
Attorney for Applicants

NEP/krp
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
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ABSTRACT OF THE DISCLOSURE

~~A method of polishing substrates enables the size of a polishing table to be reduced. A surface of a substrate to be polished is brought into contact with a polishing surface of a polishing table in such a manner that a portion of the surface of the substrate extends outwardly from an outer periphery of the polishing surface. The substrate is rotated about its center axis while keeping its surface in contact with the polishing surface of the polishing table. The attitude of the substrate carrier is controlled so that the surface of the substrate is kept parallel with the polishing surface of the polishing table during a polishing operation.~~

An apparatus for polishing a substrate enables the size of a polishing table thereof to be reduced. The polishing table has a polishing surface. A substrate carrier has a lower surface for holding a substrate having a circuit wiring pattern form thereon and bringing the substrate into contact with the polishing surface. An attitude control mechanism keeps the lower surface of the substrate carrier parallel with the polishing surface. Further, an image processing apparatus recognizes a circuit wiring pattern formed on the substrate. The substrate carrier is positionable over the polishing table and the image processing apparatus.